

leporina was picked both on Lochnagar and on Cairn Toul; *Carex vaginata* was found on every hill in the Braemar district; *Woodsia hyperborea* was gathered in Glen Isla, Glen Phee, Clova, and on Ben Lawers; *Luzula arcuata* was seen on all the lofty summits in the vicinity of Ben-na-Muich-Dhui; *Mulgedium alpinum* was detected in considerable quantity on Lochnagar; also a beautiful variety of *Hieracium alpinum* with remarkably long leaves and involucre covered with long white silky hairs; it is *H. alpinum* var. *longifolium* of 'Flora Silesia.' In the vicinity of Ballater, and also in Glen Tilt, *Equisetum umbrosum* grew in profusion. The sides of Loch Etichan and the rocks near Loch Aven were covered with numerous alpine varieties of *Hieracia*, presenting remarkable transition forms: among them were *H. alpinum*, *Halleri*, *nigrescens*, *Lawsoni*, &c. *Orobus niger* was gathered at the Pass of Killiecrankie.

Dr. Balfour then made some remarks on the progress of vegetation in the vicinity of Edinburgh and the injury done by the late frost, in the course of which he stated that *Galanthus nivalis* was in flower in the Botanic Garden, and *Eranthis hyemalis* in Dr. Neill's garden on the 10th inst.

MISCELLANEOUS.

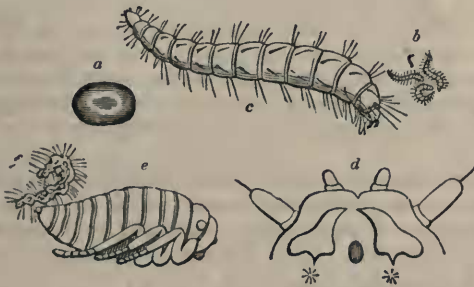
THE COMMON FLEA (PULEX IRRITANS).

EVERYBODY knows that common domestic insect, the flea; but it is not everybody who knows that it undergoes a series of changes as singular as those of the butterfly or beetle; being first a minute egg, then a long slender worm-like larva, then an inactive pupa inclosed within a cocoon spun by the larva; and lastly, the perfect flea itself. My object in this article is to describe these transformations, and to add a practical suggestion for the easy destruction of these little pests.

During the course of the past summer, having dropped a very minute insect on the floor of my library, close to the spot where one of my spaniels is in the habit of lying near my feet, I was obliged, in order to find it, to sweep the carpet very carefully with a fine brush upon a piece of white paper. By doing this I found my specimen; but I also discovered a number of very small, white, worm-like larvæ, which I immediately recognised as those of the common flea. I was not sorry to make this discovery, being anxious to examine the structure of this larva, and especially that of the parts of its mouth (hitherto undescribed), in consequence of the interesting position which the perfect insect occupies in the classification of hexapod insects, forming, as it does, a separate order, to which the name of Aphaniptera has been applied, from no wings being visible upon the insect, although their representatives exist in the shape of two flattened scales on the sides of the body attached to the proper wing-bearing segment.

The female flea deposits about a dozen white, slimy eggs of an oval form (fig. *a*, one of the eggs very highly magnified), and which are of a rather large size in proportion to that of the parent insect. The larvæ are hatched in summer at the end of five or six days. They are at first white, but subsequently assume a slight reddish tinge,

with a dark, longitudinal streak down the back, which is the dorsal vessel. They are long and slender (fig. *b* represents a group of four of them of the natural size, and fig. *c* one of them highly magnified). The body consists of thirteen segments, gradually but slightly tapering towards the head, the segments being armed at the sides with strong bristles. They are destitute of legs, but are nevertheless able to crawl along with great rapidity, using the parts of the mouth and the appendages at the end of the body in locomotion. When disturbed they writhe about in a serpentine direction, or coil themselves up spirally remaining for a short time immoveable, and thus easily escape observation. The head is small and conical, furnished with two short antennæ composed apparently of two joints, the basal one being very short, and the outer one terminated by a bristle (fig. *d* represents the front of the head seen from above, very highly magnified); the mouth is furnished with two large brown horny jaws, pointed in a slight hook at the tips (fig. *d***), and the lower part of the mouth seems to consist of a large fleshy somewhat bilobed lip, furnished with two very minute two-jointed palpi. I also observed a small semi-globular tubercle on each side of the head behind the antennæ, which may be the rudimental eyes. The terminal segment of the body is furnished with two small deflexed hooks, preceded by a coronet of minute setæ, and which are evidently employed in walking.



When full-grown these larvæ assume the pupa state, having first entirely voided the remains of their undigested food, as is the custom with other larvæ. All the larvæ which I kept encased themselves within a cocoon of a silky texture and of an ellipsoid form, of a whitish colour within and grayish externally, often covered with minute particles of the adjacent materials. Rösel, however, observed that some of the larvæ underwent these changes without forming a cocoon. The pupa inclosed within the cocoon bears considerable resemblance to the perfect insect, with this difference, that the legs are folded close on the sides of the body, and the insect is inclosed within a thin pellicle, each of the limbs being covered by a distinct case; of course during this period the insect remains quite inactive, but as soon as the period for its final transformation arrives, it stretches forth its limbs, and casts off the thin pellicle with which it had been covered, and then appears as a perfect flea. Figure *e* represents the pupa highly magnified, with the cast skin of the larva (fig. *f*) attached to the extremity of its body.

One curious question still remains to be decided in the natural history of this insect, namely, the nature of the food of the larva. Although the perfect insect is generally found on warm-blooded animals and man, there is no question that it is capable of breeding to a vast extent in places not frequented by such animals. Rooms left for a long time vacant, and some hot sandy localities, may be found occasionally swarming with fleas. At all events the larvæ are never found on the animals attacked by the perfect insects. M. De France, who endeavoured to determine the question, found numerous small black grains in company with the eggs or larvæ of the flea, and which he asserts become the food of the larvæ, being nothing else than dried drops of congealed blood, which, upon being moistened, immediately re-assume a fluid state and red colour. These grains have been generally regarded as the excrement of the perfect fleas, but M. De France considers them to be in fact drops of blood which have fallen from the wounds made by the flea. My own opinion, now that the remarkably powerful structure of the jaws of the mouth has been discovered, is rather that the larvæ roam about and feed upon hairs or particles of woollen or feathers lying on the spots frequented by the animals attacked by the perfect flea.

The knowledge of these facts in the œconomy of this insect suggests that by carefully sweeping carpets, mats, &c., on which dogs or cats are in the habit of lying, and by collecting the sweepings in a dust-pan and burning them (instead of allowing the larvæ to creep away into cracks of the floor or even in the hollows between the threads of the carpet), we may destroy the larvæ in great numbers, and thus prevent them from arriving at their perfect troublesome form.—J. O. W. in the *Gardeners' Chronicle* for March 4.

Instance of a singular Anomaly in the History of the Honey Bee.

By GEORGE DARLING, Esq.

Mons. Huber, in his wonderful and accurate researches into the history of the Honey Bee, discovered that, if a young queen passes the twenty-first day without intercourse with the drone, she will be only partially fertile, laying nothing but the eggs of drone brood; nor does she lay these eggs in the appropriate comb, but in the comb proper for workers. This curious fact I have seen proved several times; but one not noticed by the careful Frenchman came under my observation this summer. I had placed a young queen in a small experimental hive; she was very soon impregnated, and filled a sheet of comb with eggs. I removed her to another hive, and, in the usual time, the bees turned out several young brood for queens to make up for her loss. One of these, at the proper time, emerged from the cell, and destroyed the others. Three days after hatching she began to lay eggs, and as I supposed all right, but about a week after, when I examined the hive, I found the queen thrown out, and three cells converted into royal ones; but to my surprise, I found that all the grubs were drones, both those in the forced royal cells, and those through the combs; and I have no doubt that the bees had, on finding their queen imperfect in her functions, killed and thrown her out; but here their instinct had not been sufficient to teach them that a